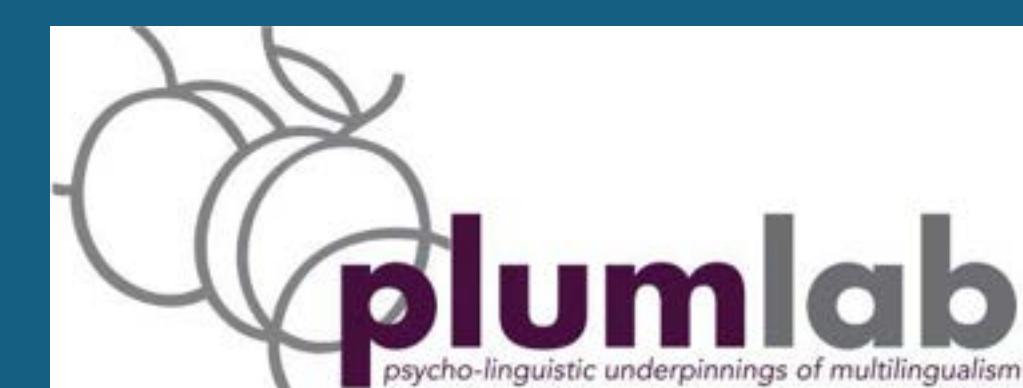


Processing Nonbinary Pronouns in L1 vs L2: An ERP Investigation

UNIVERSITY OF PITTSBURGH

LRDC Learning Research & Development Center



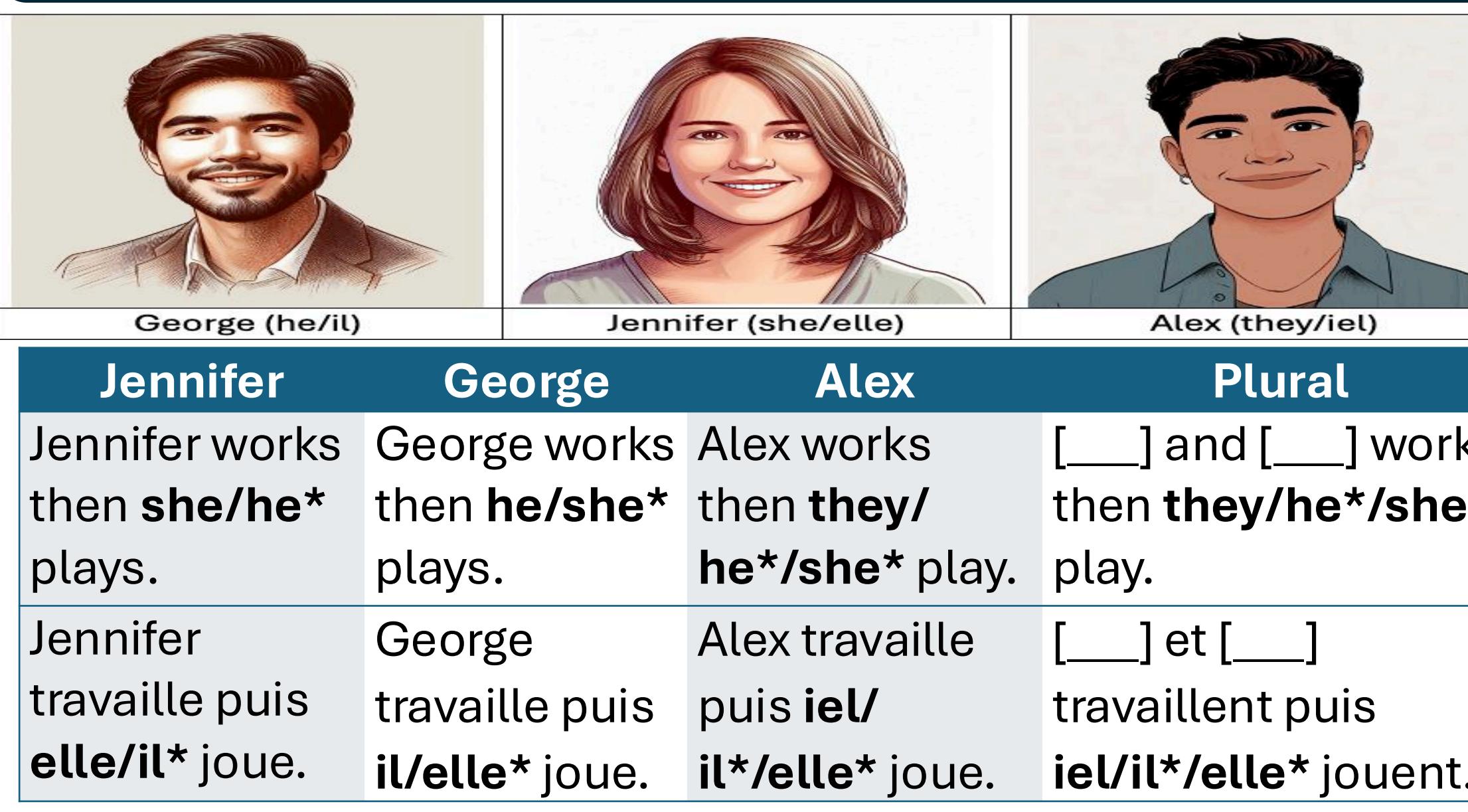
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Introduction

- Nonbinary Pronoun Constructions (NBPCs) (e.g., singular *they*) are increasingly used for referring to Nonbinary Individuals (NBIs).
- Some people report difficulty in comprehension, often citing perceived (un)grammaticality → fuels political, social, linguistic, and psychological discourse + activism.¹
- Previous studies on online processing report P600 effects for singular *they*, but do not establish it as an NBPC specific to an NBI.^{2,3}
- L2 English research:** Some singular *they* studies show increased processing costs,^{4,5} but no comparable L2 studies exist for other languages.
- Explicit pronoun introduction⁶ and increased exposure⁷** promotes correct interpretation.

Method



- N = 39 Right-handed L1 English participants
- 3 Sessions across 5 days (48 hrs between each)
- Trained⁸ on subset of French grammar and vocabulary with inclusion of French neopronoun *iel*⁹, S1 and S2
- Completed Acceptability Judgement Task (AJT) w/ EEG recording, S2 and S3
 - 2048 Hz, Quik-Cap 32 Ag/AgCl, <10 kΩ
- Individual Differences: Transgender IAT, WMU, Social & Economic Conservatism Scale
- Cis (Jennifer + George), NB, Plural (Combination)
- Analysis performed using General Additive Mixed Models, fit per time window (TW) of interest

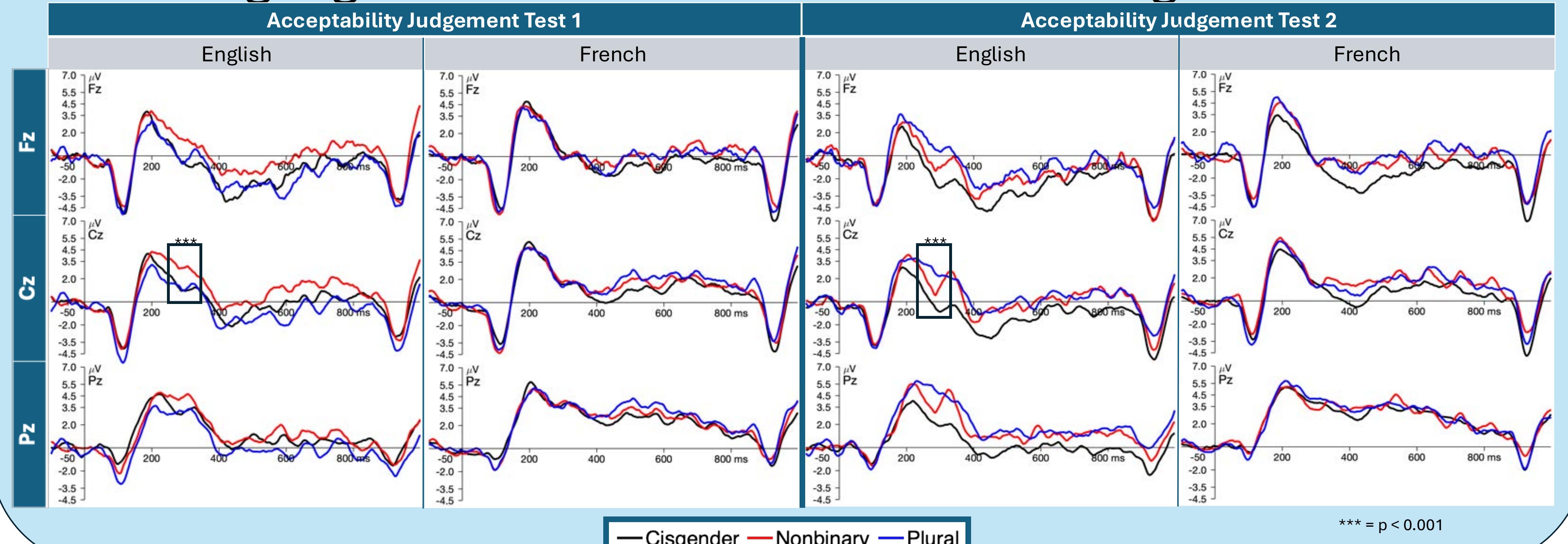
TWamp ~ Language*Construction*Acceptability*AJT + s(subject, bs = "re") + s(item, bs = "re")

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Results

Disentangling Biosocial Gender and Number Agreement



Discussion

Comparing the Conditions

- Standard pronouns (cis & sometimes plural) show a 400 ms TW negativity compared to NBPCs → Possible Task Effect?
 - Fronto-Central distribution may contribute to perceived positive deflections.
- First significant in English AJT1, visually suggested in French AJT1, but both emerge in AJT2.
- Previously reported P600 effects for NBPCs not strongly supported.
 - P6a/b regions show complexity due to TE.
- NBPCs may require greater cognitive load, shown by 300 ms TW positivity.
- IDV: Higher WMUC predicts higher 300 ms TW amplitude → linked to antecedent retrieval.

Pronoun Violations

- Misgendering cis characters consistently elicits P600 across languages/tests.
- Misgendering NB characters:**
 - English: P6a in AJT1, evolves into P300 + marginal P200 in AJT2.
 - French: P600 shifts to N400, reflecting semantic (not syntactic) processing of biosocial gender.
 - IDV: Lower SECS scores → N400 effects in AJT1 instead of P600.
- Number Violations:**
 - P600 effects consistent except in French AJT2 → Possible L2 learning of biosocial gender-based agreement rules?

Referential Failure

- Nref effects suggest referential processing failure, indicating sensitivity to misgendering (NB & cis) in English AJT1.
- IDV analysis: Sensitivity decreases with higher (more conservative) SECS scores.

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Referential Failure Driven by Individual Differences

